ONLINE TRANSPORT FARE STUDY BASED ON ABILITY TO PAY AND WILLINGNESS TO PAY (STUDY CASE: CAMPUS 2 UNIVERSITAS MUHAMMADIYAH SURAKARTA)

Arranged as one of requirement to finish Bachelor Study Program in Civil Engineering Department Engineering Faculty

By:

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ENGINEERING FACULTY

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APPROVAL SHEET

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ONLINE TRANSPORT FARE STUDY BASED ON ABILITY TO PAY AND WILLINGNESS TO PAY (STUDY CASE: CAMPUS 2 UNIVERSITAS MUHAMMADIYAH SURAKARTA)

Abstrak

Kehadiran layanan transportasi berbasis aplikasi online yang menggunakan internet sangat berpengaruh bagi orang-orang dalam semua kegiatan dengan cepat dan efisien. Penelitian ini dilakukan untuk mengetahui karakteristik komunitas akademik Kampus 2 Universitas Muhammadiyah Surakarta terhadap tarif angkutan online berdasarkan ATP dan WTP. Data yang digunakan dalam penelitian ini adalah kuesioner yang diisi oleh 389 responden. Komponen yang dibutuhkan dalam perhitungan ATP dan WTP adalah jarak rata-rata dan biaya rata-rata satu perjalanan dan alokasi biaya transportasi online per bulan. Berdasarkan hasil analisis, diketahui bahwa lebih banyak yang menggunakan angkutan online daripada yang tidak. Sebagian besar bepergian 1-5 kali sebulan. Jarak rata-rata responden Go Ride kurang dari 5 Km dan Go Car 5-10 Km dalam sekali perjalanan. Nilai rata-rata ATP Go Ride adalah Rp3.987,00 dan Go Car adalah Rp. 6,444.00. Nilai rata-rata WTP Go Ride adalah Rp. 2.001.00 dan Go Car adalah Rp. 3,165.00.

Kata Kunci: Kemampuan Membayar, Kesediaan Membayar, Transportasi online

Abstract

The presence of online application-based transportation services that use the internet is very influential for people in all activities quickly and efficiently. This study was conducted to determine the characteristics of the academic community of Campus 2 of Universitas Muhammadiyah Surakarta on online transportation and online transport fares based on ATP and WTP. The data used in this study is a questionnaire filled by 389 respondents. The components needed in the calculation of ATP and WTP are the average distance and the average cost of one trip and the allocation of online transportation costs per month. Based on the results of the analysis, it is known that more online transport than those who do not. Most traveled 1-5 times a month. The average distance of Go Ride respondents is less than 5 Km and Go Car 5-10 Km on a single trip. The average value of ATP Go Ride is Rp.3,987.00 and Go Car is Rp. 6,444.00. The average value of WTP Go Ride is Rp. 2,001.00 and Go Car is Rp. 3,165.00.

Keywords: Ability to Pay, Willingness to Pay, Online transportation

1. INTRODUCTION

Transportation is the transfer of people or goods using vehicles driven by humans or machines (Andriansyah, 2015). Online transportation is a tool that is very much needed today because the existence of transportation can make work effective and help meet daily needs (Rifaldi et al., 2016)**.** Facilities supporting transportation at this time must be equivalent to the development of life activities, especially land transportation (Lestari, 2016).

Geographically, the location of Surakarta City is very stfaregic and is a crossing point for regional transportation routes and at the same time as a destination and generation of movements (Irene et al., 2001). The city of Surakarta or often called the city of Solo is classified as a secondary city or a growing middle class city (Andriani & Yuliastuti, 2013). Since 2016, Gojek has been present in Solo City. One of the places where Gojek drivers are located is around the campus of Surakarta Muhammadiyah University located on Jl. A. Yani, Pabelan, Kartasura, Sukoharjo Regency, Central Java. Areas that contain drivers are around Campus 2 ATMs and Alfamidi.

Transportation services today are considered as a very important means in people's lives. Transportation is used by every community to facilitate their daily activities. Everyone certainly needs transportation in various activities such as working, going to school, traveling or other activities (Mandraguna, 2017). Therefore, transportation service entrepreneurs are competing to attract their customers with improved services, ease of ordering, fleet comfort, punctuality and so on (Mar'ati & Sudarwanto, 2005).

Especially online transportation services are now growing rapidly. The increasing number of users has also increased the number of drivers. The ease of accessing via cellphone is the user's attraction. Moreover, online freight fares are more affordable than public transportation of the kind. Based on this explanation, one of the factors that influence people's interest in using online transport is the online freight fare itself. Then it is necessary to study online transport fares to determine the suitability of fares that apply to the ability and willingness to pay

the academic community of Surakarta Muhammadiyah University as users of online transportation services.

2. METHOD

2.1. Site of Research

This research is located on campus 2 of Universitas Muhammadiyah Surakarta. Universitas Muhammadiyah Surakarta is a private university located on Jl. A. Yani, Pabelan, Kartasura, Sukoharjo Regency, Central Java. UMS also has a large number of students compared to other private campuses in Surakarta. The reason for choosing it is because there are Gojek drivers around the campus such as Figure 1 and Figure 2.

Figure 1. The position of Go Ride Driver

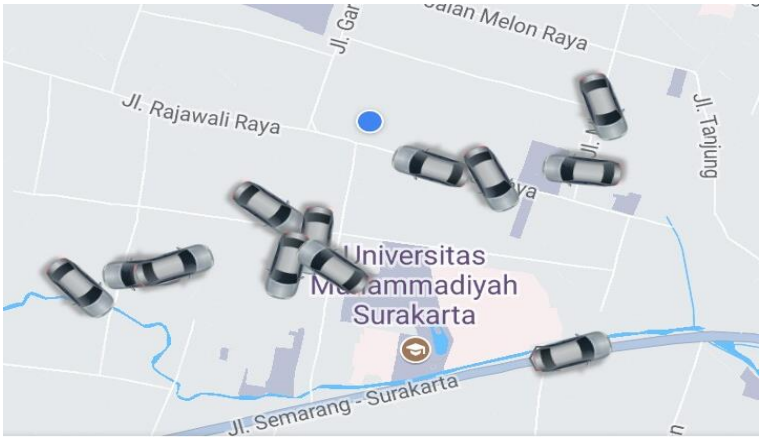

Figure 2. The position of Go Car Driver

2.2. Data

This study uses questionnaire data distributed to students, lecturers, and employees. The questionnaire was used in the form of a list of questions structured in multiple choice questions and open questions. The distribution of questionnaires was done online and manually. Distribution online through the site http://docs.google.com, so that they can log in with the e-mail address of each respondent.

The academic community at Campus 2 Universitas Muhammadiyah Surakarta amount to 14,592 people (Biro Administrasi Akademik UMS, 2018). Calculation of samples using the Slovin formula (Amirin, 2011) with a 5% error tolerance limit obtained by 389 respondents. Respondents were divided into 377 students, 7 lecturers, and 5 employees.

2.3. Data Analysis

After obtaining the research data from the questionnaire, then the data obtained from the respondents were analyzed and labeled according to the original data. The ATP and WTP values were obtained by the following formula.

$$\text{ATP} = \sum \frac{(Fare\ per\ Km\ x\ N)}{N} \quad \text{.....(1)}$$

$$\text{Fare per Km} = \frac{\text{Average allocation of online transportation costs per month}}{\text{Average travel distance}} \quad \text{..(2)}$$

(Mahalli, 2013)

$$\text{WTP type of work} = \frac{\sum(Selected\ Fare \times number\ of\ respondents)}{the\ number\ of\ all\ respondents\ in\ each\ type\ of\ work} \quad \text{.....(3)}$$

$$\text{WTP average} = \frac{\sum(WTP\ type\ of\ work)}{number\ of\ professional\ categories} \quad \text{.....(4)}$$

(Tamin dkk, 1999)

3. RESULT AND DISCUSSION

3.1. Trip's Interests and Characteristics of the Respondent

From the results of the questionnaire to 389 respondents, there were 377 students, 7 lecturers, and 5 employees.

a. Interests of Respondent

From 389 respondents, 322 were users of Go Ride and Go Car, while 67 were non-users. This can be said to use more vehicles than those that do not. The reasons why using both can be seen in Table 1, while the reasons why not using it can be seen in Table 2.

Table 1. Percentage of Go Ride and Go Car User Reasons

Reasons to use	N (*Go Ride*)	Percentage (%)	N (*Go Car*)	Percentage (%)
Do not have a private vehicle	34	13.99	28	16.00
Cannot use motorized vehicles	4	1.65	0	0
Can pick up to the front of the house	40	16.46	5	2.86
No rain	0	0	43	24.57
Not hot	0	0	**47**	**26.86**
Fast	48	19.75	9	5.14
Cheap	25	10.29	25	14.29
Lazy driving	**57**	**23.46**	3	1.71
Others	35	14.40	15	8.57
Total	243	100	175	100

Based on Table 1, most respondents use Go Ride for reasons of laziness to drive, with a percentage of 23.46%. While those who use Go Car for reasons of not overheating, with a percentage of 26.86%.

Table 2. Percentage of Non-User Reasons

Reason for not using	N	Percentage (%)
Have a private vehicle	61	61.62
Not used to using online services	25	25.25
Wasteful	11	11.11
Others	2	2.02
Total	99	100

Based on Table 2, many respondents have private vehicles (60.42%) so they do not use online transportation.

b. Characteristics of Go Ride Respondent

Every respondent of Go Ride users travels with travel frequency, average distance and cost on a different trip. The percentage of Go Ride users can be seen in Table 3.

Table 3. Percentage of Go Ride Users

Frequency of Trip	N	Percentage (%)	Average distance of one trip	N	Percentage (%)	Average cost of one trip	N	Percentage (%)
1-2 kali/hari	18	9.57	<5 Km	72	38.30	<10rb	70	37.23
3-4 kali/hari	8	4.26	5-10 Km	67	35.64	10rb-15rb	69	36.70
1-5 kali/minggu	36	19.15	10-15 Km	34	18.09	15rb-20rb	35	18.62
6-10 kali/minggu	2	1.06	15-20 Km	13	6.91	20rb-25rb	10	5.32
10-15 kali/minggu	1	0.53	20-25 Km	0	0	25rb-30rb	3	1.60
1-5 kali/bulan	88	46.81	25-30 Km	0	0	30rb-35rb	0	0
6-10 kali/bulan	10	5.32	30-35 Km	1	1	35rb-40rb	0	0
11-15 kali/bulan	2	1.06	>35 Km	0	0	>40rb	0	0
16-20 kali/bulan	0	0	Kosong	1	0.53	Kosong	1	0.53
Lainnya	22	11.7	Total	188	100	Total	188	100
Kosong	1	0.53						
Total	188	100						

Based on Table 3, most respondents traveled 1-5 times a month with a percentage of 46.81%. The average distance of respondents was dominated by less than 5 Km per trip with a percentage of 38.30%. The average cost of a one-time trip is at least Rp.10,000.00 with a percentage of 37.23%.

c. Characteristic of Go Car Responden

Every Go Car user respondent travels with travel frequency, average distance and cost in one different trip. The percentage of Go Car users can be seen in Table 4.

Table 4. Percentage of Go Car Users

Frequency of Trip	N	Percentage (%)	Average distance of one trip	N	Percentage (%)	Average cost of one trip	N	Percentage (%)
1-2 kali/hari	17	13.60	<5 Km	18	14.40	<20rb	33	26.40
3-4 kali/hari	2	1.60	**5-10 Km**	**60**	**48.00**	**20rb-25rb**	**37**	**29.60**
1-5 kali/minggu	8	6.40	10-15 Km	18	14.40	25rb-30rb	20	16.00
6-10 kali/minggu	0	0	15-20 Km	12	9.60	30rb-35rb	16	12.80
10-15 kali/minggu	0	0	20-25 Km	11	8.80	35rb-40rb	9	7.20
1-5 kali/bulan	**63**	**50.40**	25-30 Km	4	3.20	40rb-45rb	3	2.40
6-10 kali/bulan	5	4.00	30-35 Km	1	0.80	45rb-50rb	1	0.80
11-15 kali/bulan	0	0	>35 Km	1	1	>50rb	5	4.00
16-20 kali/bulan	1	0.80	Total	125	100	Kosong	1	0.80
Lainnya	29	23.20				Total	125	100
Total	125	100						

Based on Table 4, most respondents use it within a period of 1-5 times a month, with a percentage of 50.40%. The average distance of one trip is 5-10 Km,

with a percentage of 48.00%. The average cost of one trip is Rp.20,000.00-Rp. 25,000.00 with a percentage of 29.60%.

3.2. Fare Analysis Based on Ability to Pay

The approach used in ATP analysis is based on the allocation of the cost of online transportation in one month and the average distance of a user's trip.

a. Go Ride

The results of the recapitulation found that there were 188 Ride users. Of these, there were 15 data that were not used in the analysis because there were ATP components not filled in, so the total data was 173 respondents. Data recapitulation used for analysis can be seen in Table 5.

Table 5. Analysis's Recapitulation of Fares Based on ATP (Go Ride)

N (person)	Profession	A	B	W (Km)	X (times/ month)	Y (Km/month)	Z per month (Rp)	Fare per Km (Rp)
171	Student	5-10 Km	<50rb	5.6	4	22	48488	2167
5	Lecturer	<5 Km	50rb-100rb	1.8	3	5	85000	15740
5	Employee	<5 Km	50rb-100rb	3.4	6	20	75000	3690
A :	Average one-way distance (Km)			W:	Midpoint of A		Y : Total distance in 1 month	
B :	Allocation of online transportation costs per month			X:	Frequency of trips/ month		Z : Midpoint of B	

From the calculation of ATP, the ATP value was Rp. 2,617.00 for the student category, Rp. 15,740.00 for the lecturer, and Rp. 3,690.00 for the employee category. Based on the ATP value of each category, it can be said that the ATP value of employees is higher than that of students.

b. Go Car

Go Car users numbered 122 respondents. From these, there are 8 data that are not analyzed because there are ATP components not filled in, so the total data is 114 respondents. Data recapitulation used for analysis can be seen in Table 6.

Table 6. Analysis of Fares Based on ATP (Go Car)

N (person)	Profession	A	B	W (Km)	X (times/ month)	Y (Km/month)	Z per month (Rp)	Fare per Km (Rp)
114	Student	20-25 Km	50rb-100rb	25	3	74	76330	4164
5	Lecturer	15-20 Km	100rb-150rb	16	3	47.5	135000	6444
2	Employee	10-15 Km	50rb-100rb	15	2	30	105665	2875
A :	Average one-way distance (Km)			W:	Midpoint of A		Y : Total distance in 1 month	
B :	Allocation of online transportation costs per month			X:	Frequency of trips/ month		Z : Midpoint of B	

From the calculation results obtained the ATP value for the student category is Rp.4,164.00, Rp.6,444.00 for the lecturer, and Rp. 2,857.00 for the employee. The average ATP value for the entire category is Rp.4,236.00.

3.3. Fare Analysis Based on Willingness to Pay

The WTP value obtained from each respondent is in the form of realistic fares according to respondents for online transportation services.

a. Go Ride

Go Ride users have 188 respondents. Of these, there are 2 data that cannot be analyzed because there are WTP components that are not filled, so the total data is 186 respondents, where there are 184 student categories and 2 respondents. Data recapitulation can be seen in Table 7.

Table 7. Analysis of Fares Based on WTP (Go Ride)

N (person)	Profession	The average cost of a trip (a)	The average distance of a trip (b)	x (Rp)	y (Km)	Fare per Km (Rp)
184	Student	10rb-15rb	5-10 Km	11459	7.6	1926
5	Lecturer	10rb-15rb	5-10 Km	14000	6.5	3048
5	Employee	20rb-25rb	5-10 Km	22500	5.5	3747
x :	Midpoint of a					
y :	Midpoint of b					

From the calculation results, the WTP value is Rp.1,926.00 for the student category, Rp.3,048.00 for the lecturer, and Rp.3,747.00 for the employee category. The average WTP value for the entire category is Rp. 2,001.00.

b. Go Car

Go Car users have 122 respondents. From this number, there is 1 data that cannot be analyzed because there are WTP components that are not filled, so the total data is 121 respondents. Data recapitulation can be seen in Table 8.

Table 8. Analysis of Fares Based on WTP (Go Car)

N (person)	Profession	The average cost of a trip (a)	The average distance of a trip (b)	x (Rp)	y (Km)	Fare per Km (Rp)
121	Student	25rb-30rb	5-10 Km	25335	9.6	3191
5	Lecturer	20rb-25rb	10-15 Km	24500	14.5	2760
2	Employee	25rb-30rb	10-15 Km	27500	12.5	2619
x :	Midpoint of a					
y :	Midpoint of b					

From the calculation results, the WTP value is Rp.3,191.00 for the student category, Rp.2,760.00 for the lecturer category, and Rp. 2,619.00 for the employee. The average WTP value for the entire category is Rp.3,165.00.

3.4. Fare Comparison

The current fare for Go Ride is IDR 4,000 at the first 1 Km. After that at the second Km and so on, the fare will be approximately Rp.2,000.00 per Km. While the current fare for Go Car is IDR 12,000 at the first 3 Km. After that above 3 Km, the fare will be approximately Rp.4,000.00 per Km.

Based on ATP, WTP, and fare in the field, the recapitulation can be made as in Table 9.

Table 9. Fare Comparison

Type	ATP	WTP	Field
	(Rp/Km)	(Rp/Km)	(Rp/Km)
Go Ride	2,629	1,953	2,000
Go Car	4,275	3,190	4,000

The ATP value is greater than the WTP value. Based on the relationship between ATP and WTP in Chapter III sub B.3, this indicates that the ability to pay for transportation services is greater than the willingness to pay. In this condition, the user has a relatively higher income but the utility for the service is relatively lower. User groups are called choiced riders. The Go Ride and Go Car fares in the field can be said to be close to the WTP value and below the ATP value. This shows that the current fare is in accordance with the ability and willingness of users.

4. CLOSING

The results of the questionnaire to 389 respondents are known, respondents consisted of 273 Go Ride and Go Car users and 67 non-users so that more people are interested in using online transportation than those who don't. Respondents mostly use Go Ride for reasons of laziness to drive (23.46%) and respondents who use Go Car the most for reasons of not overheating (26.86%). The reason respondents did not use both was to have a private vehicle (61.62%). Respondents

who used Go Ride traveled the most 1-5 times a month (46.81%). The average distance of the respondent is less than 5 Km per trip (38.30%). The average cost of one trip is at most less than Rp.10,000.00 (37.23%). Most Go Car respondents use it within a period of 1-5 times a month (50.40%). The average one-way distance is 5-10 Km (48.00%). The average cost of one trip is Rp.20,000.00-Rp. 25,000.00 with a percentage of 29.60%. Results of ATP and WTP analysis are obtained the average ATP Go Ride value for the entire category is Rp. 3,987.00, while Go Car is Rp. 6,444.00. The average WTP Go Ride value for the entire category is Rp. 2,001.00, while Go Cars is Rp. 3,165.00.

REFERENCES

Andriansyah. (2015). *Manajemen Transportasi dalam Kajian dan Teori*. (E. Mardhiati, Ed.). Fakultas Ilmu Sosial dan Ilmu Politik Universitas Prof. Dr. Moestopo Beragama. Retrieved from http://journal.unair.ac.id/filerPDF/Transportasi Publik dan Aksesibilitas.pdf

Rifaldi, Kadunci, & Sulistyowati. (2016). Pengaruh Kualitas Pelayanan Transportasi Online Gojek Terhadap Kepuasan Pelanggan Pada Mahasiswa / I Administrasi Niaga Politeknik Negeri Jakarta. *Epigram, 13(2), 13*(2), 121–128.

Lestari, M. W. (2016). Analisis Kelayakan Tarif Batik Solo Trana (BST) Ditinjau Dari Ability To Pay (ATP) Dan Willingness To Pay (WTP) Disusun sebagai salah satu syarat menyelesaikan Program Studi Strata I pada Analisis Kelayakan Tarif Batik Solo Trans (BST).

Irene, K., Shintya, B., Nurmedha, A., Annisa, W., & Nurhuda, R. (2001). *Pertumbuhan kota*.

Andriani, D. M., & Yuliastuti, N. (2013). Penilaian Sistem Transportasi yang Mengarah Pada Green Transportasi di Kota Surakarta, *9*(2), 183–193.

Mahalli, K. (2013). Analisis Ability To Pay Dan Willingness To Pay Pengguna Jasa Kereta Api Bandara Kualanamu (Airport Railink Service), 167–179.

Mandraguna, W. H. (2017). Pengaruh Kualitas Layanan Terhadap Loyalitas Pelanggan GO-JEK (Studi Pelanggan Jasa Transportasi Go-Jek Surakarta), 9.

Mar'ati, N. C., & Sudarwanto, T. (2005). Pengaruh Kualitas Layanan dan Harga Terhadap Kepuasan Pelanggan Jasa Transportasi Ojek Online (Studi Pada

Konsumen Gojek di Surabaya). *Letters in Applied Microbiology*, *2705*, 4–6. https://doi.org/10.1103/PhysRevA.65.033619

Biro Administrasi Keuangan. 2018. Universitas Muhammadiyah Surakarta

Amirin, T., 2011, Populasi Dan Sampel Penelitian 4: Ukuran Sampel Rumus Slovin, Erlangga, Jakarta.

Tamin, Ofyar Z, dkk, 1999. Evaluasi Tarif Angkutan Umum dan Analisis „Abilitiy To Pay" (ATP) dan „Willingness To Pay" (WTP) di DKI Jakarta. Jurnal Transportasi Forum Studi Transportasi Antar Perguruan Tinggi (FSTPT) Vol 1 No.2, Tahun I, Desember 1999, ISSN: 1411-2422.

Akdon dan Riduwan. 2005. Rumus dan Data dalam Aplikasi Statistik. Bandung: Alfabeta.